TECHNICAL BULLETIN

Community Development & Planning, Building Inspections
TOPIC: Residential Patio Covers
August 5, 2014

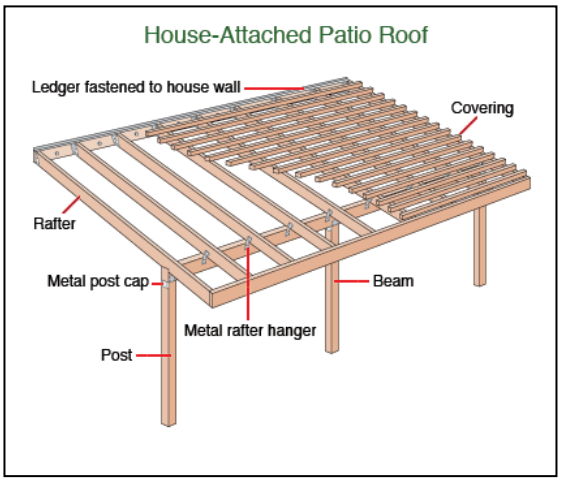
This Technical Bulletin is intended to serve as a guide to contractors and citizens to aid in the preparation of plans for the construction of residential patio covers. The illustrations shown in this bulletin are not necessarily the only methods of construction but represent the more typical approaches. The illustrations are shown only for illustration purposes and do not necessarily accurately depict all code requirements. This bulletin addresses the building code requirements - Zoning requirements will need to be separately addressed.

Patio covers of **all** metal construction must be in one of the following categories:

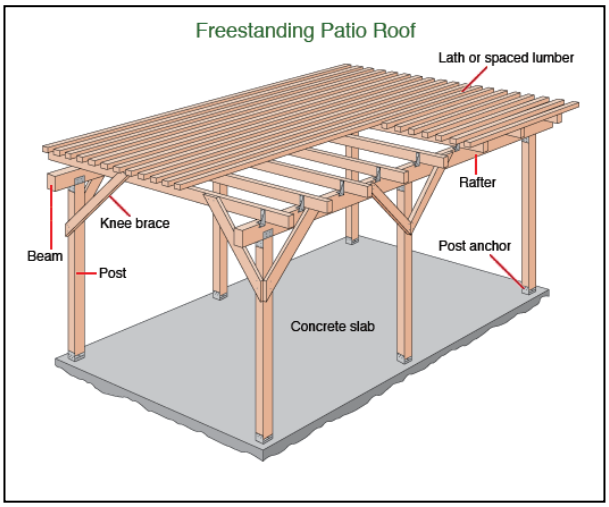
1. The patio cover must be "listed" and the permit applicant must provide a copy of the "listing" with the permit application. The listing will include a finding that the patio cover does comply with the 2009 *Edition of the International Residential Code*. (An example of such a listing is an *ICC ES Evaluation Report such as: http://www.icc-es.org/Reports/pdf_files/ESR-1398P.pdf.)*
2. The patio cover must be designed and sealed by an engineer licensed to practice in Texas. The design is based on the 2009 *Edition of the International Residential Code.*

Patio covers are either attached to an existing structure or are free standing. Those that are attached to an existing structure have either a low sloped roof or a gabled/hip roof. Examples:

The roof in the figure to the right is termed a framed in place gabled roof. The framing is designed in accordance with the 2009 IRC. This type roof must bear on footings or a foundation designed to support the imposed loads.



The roof in the figure to the left is a low slope roof [from two units vertical in 12 units horizontal (2:12) up to four units vertical in 12 units horizontal (4:12) and no ridge]. The overall minimal weight of this type of patio cover will allow the posts to bear on simple slab foundations (designed beams or footings not required)

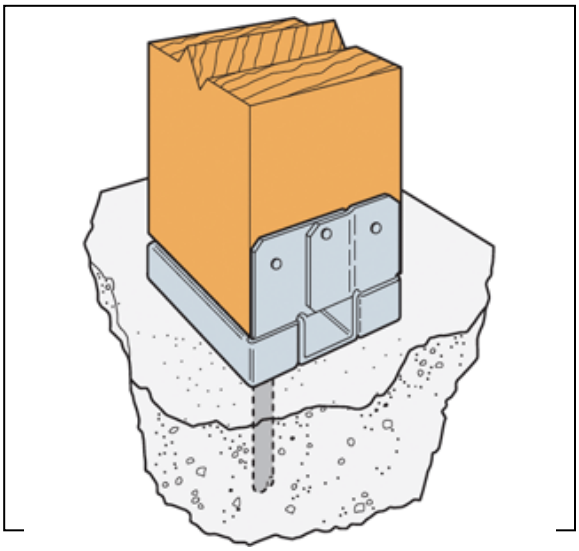


Freestanding patio covers like the one on the left are treats as a "permanent detached accessory building." Regardless of the type of roof (flat or gabled/hipped) the freestanding structure requires additional attention to framing details for wall bracing to prevent "racking." Note the added "knee braces" on the example to provide lateral stability.

Posts supporting patio covers may be either wood or metal. The examples below provide details on different means of attachments for the supporting posts.

Metal posts may be round or rectangular in shape. Steel supporting posts should be minimum wall thickness of ¼ inch or a minimum schedule 40 pipe thickness. The example on the left also shows an example of a means of connection of the post to the concrete. Metal posts may also be set in concrete.

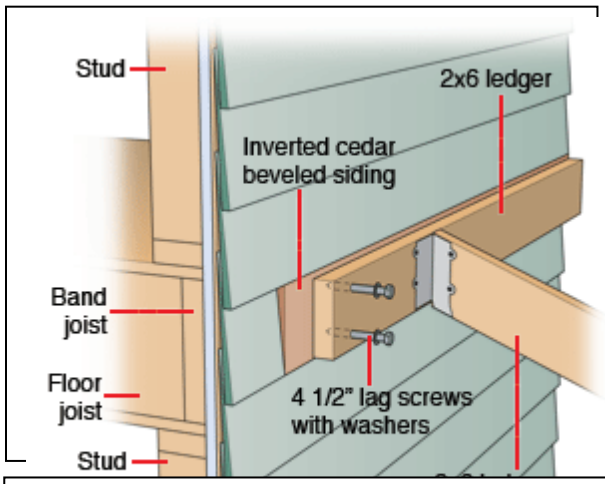
The example on the right shows a standoff base for mounting wooden support posts. The base provides for a minimum of 1" clearance between the wooden post and the concrete. The standoff base is also securely mounted to the concrete to hold the post in place. This type of standoff base may be found in the local Home Depot and Lowes Home Improvement Centers.



Footings or beams in slabs must be provided to support gabled roofs. Footings may be constructed separately or constructed as integral to the patio slab. Code requires a minimum footing depth of at least 12 inches below the undisturbed ground surface. The footing must extend beyond the frostline a minimum of 6 inches. The established frost line for this region is 6 inches.

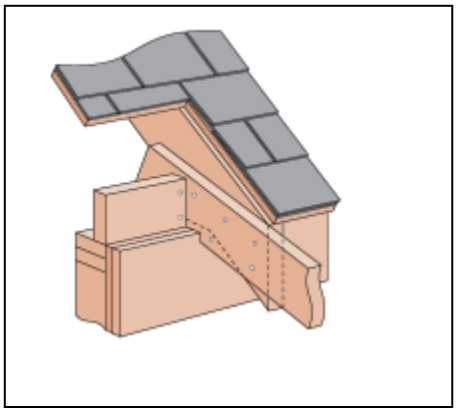
If the footing in the example measures 12x12x12 inches then the footing satisfies the minimum code requirements. The example to the left also shows a means to mount a wooden post that had been set in the concrete footing before the concrete sets. Footings may be stand alone, like in this example; or, may be built into a slab in the form of an exterior beam.

A ledger is used to fasten low sloped patio covers to a wall of the existing house. The ledger, typically a 2 by 6, is usually designed to hold one end of the patio-roof rafters. On a one-story house, it is often best to attach the ledger just below the eaves. On a two-story house, you can usually tie into a band joist (also called a rim joist), located between the floors. A ledger should be affixed to strong parts of the house's framing, such as second-floor joists or wall studs. The strongest ledger connection relies on bolts that run through the ledger and the house sheathing and rim joist and then are fastened with nuts and washers affixed from the other side. When access to the other side is unfeasible, use lag screws instead of bolts. If it is impossible to attach the ledger to a floor joist, then fasten the ledger to wall studs, which are generally located on 16-inch (or sometimes 24-inch) centers and doubled up around doors, windows, and other openings.



The example to the left shows attaching a ledger to a house with siding. A ledger may be anchored to a masonry wall with expanding anchor bolts but this is not the best practice.

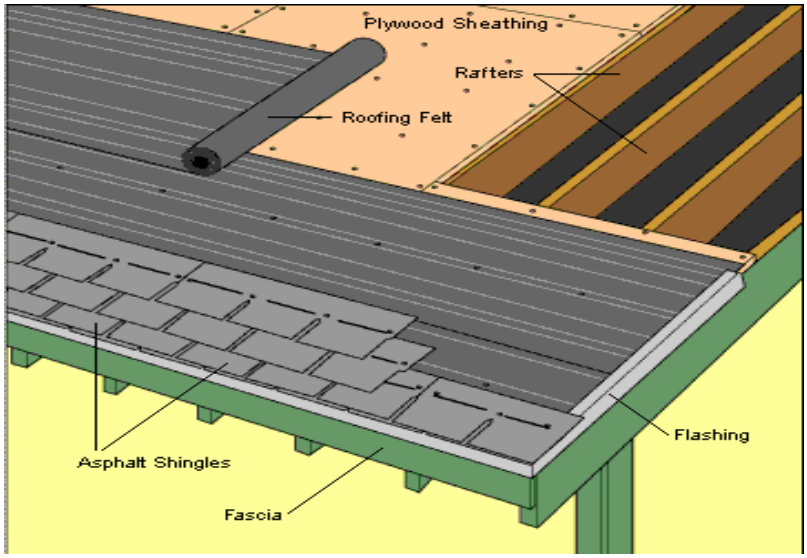
All exterior intersections of horizontal and vertical intersections must be properly flashed to prevent water damage.



The ledger may also be attached to the ends of the existing roof rafters after the fascia is removed (picture on the left); or, the patio rafters may be attached to the side of the existing roof rafters – again – after removing the fascia (picture on the right).

The patio cover will need to be roofed to complete the job.

The example below represents the installation of a basic 3-tab shingle roof covering. The patio rafters framing is covered with roof sheathing – usually a minimum 3/8 inch thick sheathing listed for exterior exposure. Aluminum clips must be installed on the horizontal joints between the rafter spans. Asphalt shingles can be used only on roof slopes of two units vertical in 12 units horizontal (2:12) or greater. For roof slopes from two units vertical in 12 units horizontal (2:12) up to four units vertical in 12 units horizontal (4:12), double underlayment application is required. The installation should always be done in accordance with manufacturer's instructions.



Detailed plans must accompany the permit application.

Following is a listing of the items that should be included on the construciton plans. The plans should be detailed sufficeintly so that any contractor could build the project with minimal instructions from the owner.

Two copies of drawings that are dimensioned and drawn to scale

1. Site plan showing the location of the patio cover with respect to existing house and all property lines; show any easements
2. Provide "listing" of "all metal" patio covers showing compliance with 2009 International Residential Code; or, the plans must be designed and sealed by an engineer licensed to practice in Texas
3. Provide detail(s) of footings/foundation; existing or proposed
4. Provide detail(s) of supporting posts and means of attachment to footing/foundation
5. Provide framing and connection details; size, specie, grade and spacing of framing members; roof slopes
6. Provide ledger details as applicable
7. Provide roof framing details as applicable
8. Provide roof decking and roof covering details as applicable
9. Provide the location of any overhead electrical drops serving the site